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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/063,939	05/28/2002	Kenneth Walter Browall	120505	9493

6147 7590 10/16/2003

GENERAL ELECTRIC COMPANY
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EXAMINER	
KALAFUT, STEPHEN J	

ART UNIT	PAPER NUMBER
1745	3

DATE MAILED: 10/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/063,939	BROWALL ET AL.	
	Examin r	Art Unit	
	Stephen J. Kalafut	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the corresp ndence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-16, 19-40* is/are allowed.

6)☒ Claim(s) *17,18 and 41-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Claims 17, 18 and 47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "parallel to the substrate" is unclear. A substrate is not a direction, but a three dimensional object. Thus, determining which direction is parallel or perpendicular thereto is impossible.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 41, 44, 45 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Singh *et al.* (US 4,894,297).

These claims are in product-by-process format, and are thus examined with respect to the characteristics of the product which results from the process, and not the process itself. See MPEP 2113 and the cases cited therein. The present product is a fuel cell comprising a substrate and at least one layer thereon (claim 41), the layer possibly being a specified electrolyte (claim 44), or having a thickness ranging from 1 to 50 microns (claim 49), or the substrate possibly being cylindrical (claim 45). Singh *et al.* disclose a fuel cell (10) including a cylindrical substrate (12) and several layers (14, 16, 18) thereon. The electrolyte (16) may be yttria stabilized zirconia, as thin as 1 micron (column 4, lines 9-12). Since the present product would be the same as that of Singh *et al.*, that patent would anticipate these claims.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Singh *et al.*

The anode of Singh *et al.* includes nickel and the electrolyte material yttria-doped-zirconia (column 4, lines 35-39). This claim differs by reciting the relative amounts of the two materials. Because the amounts of the materials would have an effect on the performance of the electrode, determining optimal portions of the materials would be a matter within the skill of the artisan. The nickel would provide catalytic activity, while the electrolyte material would allow ions to move between the nickel and the main body of electrolyte. For this reason, this claim would be obvious over Singh *et al.*

Claims 43 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh *et al.* in view of Chiao (US 5,935,727).

These claims differ from Singh *et al.* additionally by reciting that the cathode includes 20 to 80 volume percent electrolyte material such as stabilized ZrO_2. Singh *et al.* disclose Sr-doped $LaMnO_3$, which would be lanthanum strontium manganite (column 4, lines 6-8). Chiao teaches that electrodes such as cathode may be made of a mixture of electrolyte material, such as YSZ, and conductive material such as doped lanthanum chromite (column 3, lines 30-35), a material which is also contemplated by Singh *et al.* (column 4, line 1). Thus, Chiao teaches to make a

cathode which contains some electrolyte material. Since the mixing of cathode and electrolyte materials would increase the contact area between the two materials, and thus enhance reaction kinetics, it would be obvious to mix the cathode of Singh *et al.* with electrolyte material as taught by Chiao. Determining optimal proportions thereof would be within the skill of the artisan.

Claims 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh *et al.* in view of Cable *et al.* (US 5,445,903).

These claims differ from Singh *et al.* by reciting that one of the layers has a gradient in composition of porosity (either one in claim 46, the latter in claim 48), possibly in "a direction parallel to the substrate" (claim 47). Cable *et al.* teach that electrodes may have a porosity gradient therein, and between their "bulk" parts and the zone which contacts the electrolyte, and that this could be done with tubular electrodes (column 6, lines 36-40). This would increase the contact area between the electrodes and the electrolyte (column 6, line 66 through column 7, line 9). For this reason, and because Singh *et al.* disclose tubular electrodes, it would be obvious to use a porosity gradient as taught by Cable *et al.* in the electrodes of Singh *et al.* Regarding claim 47, the gradient from outer to inner regions of the electrode would be in the "direction of the substrate", to the extent that the term is understood, since the tubular substrate would define a radial direction.

Claims 1-16 and 19-40 are allowed. The actual process of making a fuel cell by depositing materials with an expanding thermal plasma apparatus is not disclosed by the prior art applied above, or cited either below or by applicant.

Claims 17 and 18 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action. These claims depend from allowable claim 1.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Spengler *et al.* (US 5,426,003) and Maskalick *et al.* (US 4,847,172) disclose tubular solid oxide fuel cells. Yang *et al.* (US 2003/0072881) and Schaepkens (US 2003/0097988) are the Pre-Grant Publications issuing from the applications cited by applicants.

The disclosure is objected to because of the following informalities: Drawing numeral 100 in figure 1 is not mentioned in the specification The numeral 212, in line 2 of section 0013, does not appear in figure 2. Appropriate correction is required.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 703-308-0433. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 703-308-2383. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.